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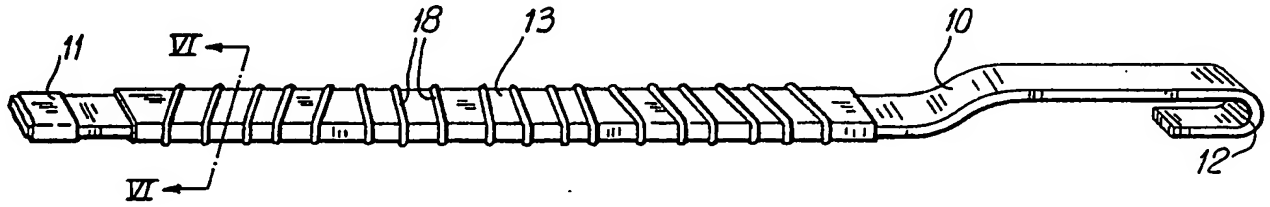

(57) Abstract

A device in windscreen wiper arms having at least one rod (10) made from spring steel, one end of said rod being mounted in a pivotable attachment arm (11) whereas the opposite rod end supports means (12) for securement of a wiper blade. The rod (10) comprises means (13-18) for disturbing the path of flow of the passing current of air in such a manner as to cause said current of air to form a pattern of irregular vortices of air downstream of the rod (10).

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A DEVICE IN WINDSCREEN WIPER ARMS FOR MOTOR VEHICLES.

TECHNICAL FIELD

The subject invention concerns a device in windscreen wiper arms comprising at least one rod made from spring steel, one end of said rod being mounted in a pivotable attachment arm whereas the opposite arm end supports means designed to secure a wiper blade.

STATE OF THE ART

Windscreen wiper arms are manufactured primarily with the aim of ensuring efficient wiping-off of liquid from the windscreen at vehicle speeds of up to approximately 200 km/h. The wiper arms are manufactured in standardized configurations for a large number of car manufacturers, the variations between different car models being slight.

One problem that arises primarily with passenger cars, is the noise that is generated by the air currents around the front windscreen wiper arms at certain speed levels. This phenomen, known as the "Karman tone", may give rise to a clear high-pitched hissing sound that is discernable above the other wind-generated noise and is clearly audible from within the vehicle compartment.

DEFINITION OF THE TECHNICAL PROBLEM

One purpose of the subject invention therefore is to provide a device for windscreen wiper arms by means of which the problem of current-induced noise is solved in a simple manner and without involving any major alterations of already existing systems.

THE SOLUTION

In accordance with the teachings of the invention, this problem is solved in that the rod comprises means designed

to disturb or disrupt the flow path of a current of air passing over it, thus forcing the current of air to form irregular vortices of air downstream of the rod.

Advantageous modifications of the invention will appear from the appended dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Six embodiments of the invention will be described in closer detail in the following with reference to the accompanying drawings, wherein

Figs. 1 - 5 illustrate five different versions of a rod for use together with a windscreen wiper arm, and

Fig. 6 is a sectional view along line VI-VI of Fig. 5.

PREFERRED EMBODIMENTS

The wiper arm rod 10 illustrated in Figs. 1-5 is mounted in any conventional manner in a pivotable attachment arm, the latter indicated by reference 11, whereas the opposite end supports means for securement of a wiper blade, not shown. The rod 10 is made from spring steel having a predetermined radius of curvature in order to serve as a spring element between the rigid attachment arm and the wiper blade which is mounted in the U-shaped end portion 12 of the arm.

Fig. 1 illustrates a modification of the invention, according to which the rod is provided with an addition 13 in the form of a C-shaped sheet-metal member formed with essentially circular perforations and clamped onto the rod. The perforations 14 are intended to disturb the flow of the air past the wiper arm rod, creating an irregular flow pattern, which prevents the generation of a strong clear resonance note.

Fig. 2 illustrates another modification according to which the addition consists of a member of expanded sheet metal formed with slit-like perforations. The sheet-metal edges which upon expansion of the sheet metal will project on either side of the slits 15 positively prevent regular, noise-generating vortices from forming around the rod.

Fig. 3 illustrates yet another modification according to which the rod 10 proper is formed with essentially circular perforations 16, the purpose of which is to create leakage flows through the rod 10. In this case, therefore, it is not necessary to provide the rod with any addition but the rod could in itself be designed to ensure that regular vortices do not arise. For instance, the rod 10 may be given a profile geometry similar to that of a wing having its convex surface facing downwards so as to press the wiper blade against the windscreen. However, it is necessary to ensure that the properties of resiliency of the rod are not affected.

Fig. 4 illustrates another rod 10 which again has an addition 13 in the form of a spirally coiled member. The pitch of the helical turns 17 of the coil varies along the length of the rod in order to ensure an irregular flow pattern, irrespective of the sweep angle of the wiper arm relatively to the speed-generated wind or airstream caused by the movement of the car.

Fig. 5, finally, illustrates a modification according to which the addition 13 is a plastics casting exhibiting a number of ribs or ridges 16 extending obliquely across the flat upper face of the addition.

Fig. 6 illustrates the addition in accordance with Fig. 5 in a cross-sectional view, this drawing figure showing the manner in which the addition 13 is cast integrally with a ridge 18 and retainment shoulders 19.

Practical tests have demonstrated the ability of the devices described in the aforegoing to dampen the hissing sound down to the level of the ordinary airstream noise.

The invention is not limited to the embodiment described in the aforegoing but further modifications are possible within the scope of the appended claims.

CLAIMS

1. A device in windscreen wiper arms comprising at least one rod (10) made from spring steel, one end of said rod being mounted in a pivotable attachment arm (11) whereas the opposite arm end supports means (12) designed to secure a wiper blade, c h a r a c t e r i z e d in that the rod (10) comprises means (13 - 18) designed to so disturb the flow path of a passing current of air that the air current forms irregular vortices of air downstream of the rod (10).

2. A device as claimed in claim 1, c h a r a c - t e r i z e d in that the current disturbing means (16) are formed in the rod (10).

3. A device as claimed in claim 1, c h a r a c - t e r i z e d in that the current disturbing means are formed by one or several additional parts (13) mounted on the rod (10).

4. A device as claimed in claim 3, c h a r a c - t e r i z e d in that the additional part consists of a helically wound coil (17) of irregular pitch.

5. A device as claimed in claim 3, c h a r a c - t e r i z e d in that the additional part is shaped into a strip (13) having a C-shaped configuration which is formed with a surface structure (14; 15; 18) adapted to induce irregular air vortices.

6. A device as claimed in claim 5, c h a r a c - t e r i z e d in that the surface structure of the additional part is obtained by means of perforations (14; 15) formed in the material of the profile section.

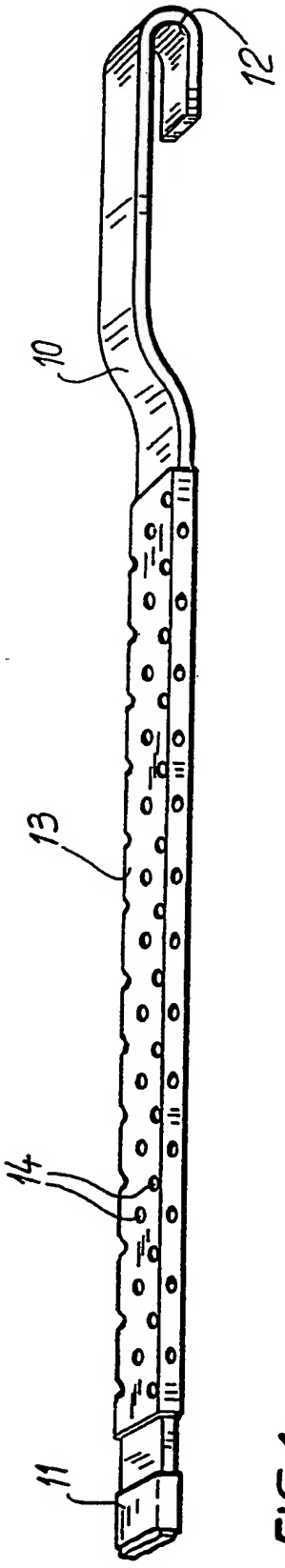

FIG.1

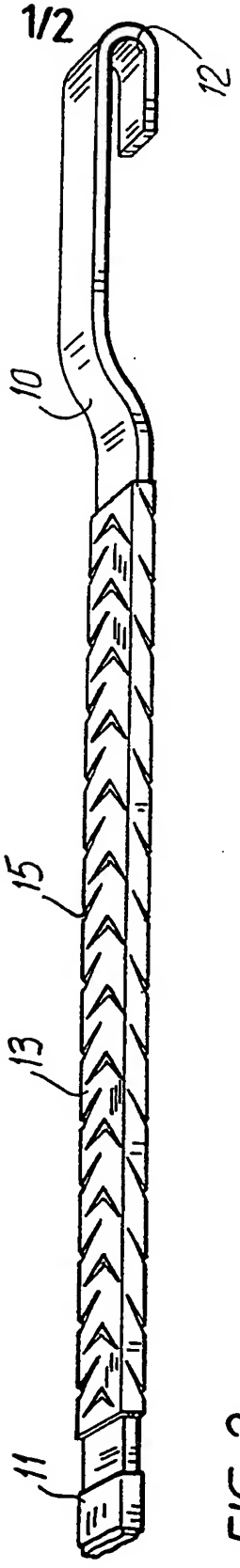

FIG.2

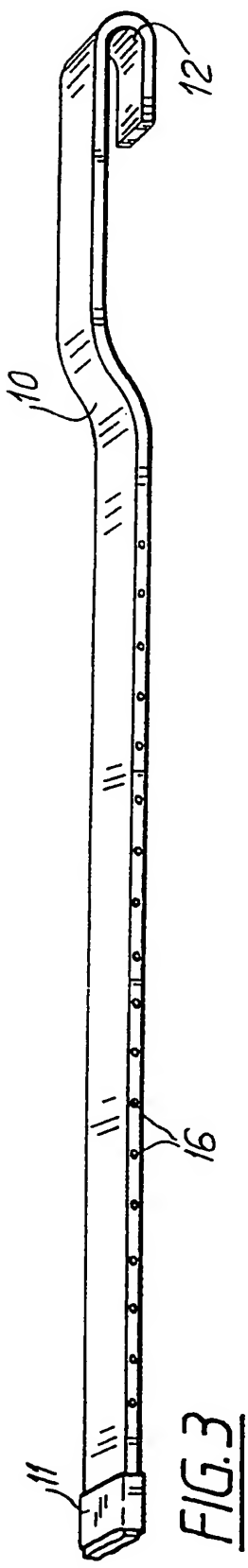

FIG.3

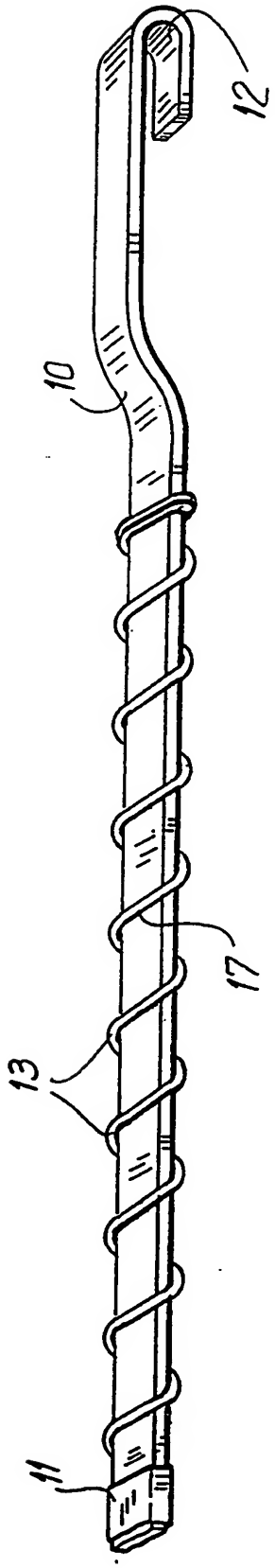

FIG.4

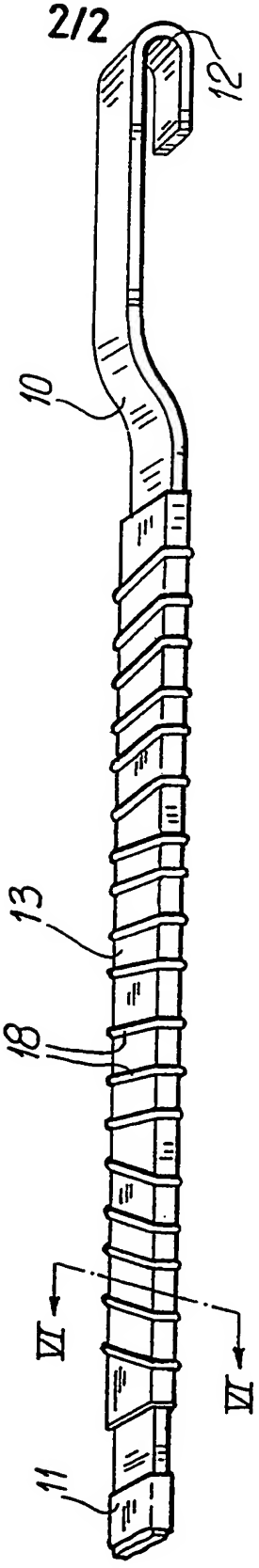

FIG.5

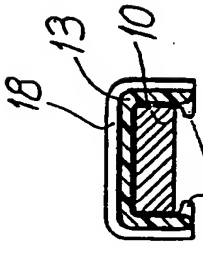

FIG.6

INTERNATIONAL SEARCH REPORT

International Application No PCT/SE 92/00410

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC5: B 60 S 1/34

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
IPC5	B 60 S

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched[8]

SE,DK,FI,NO classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category *	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
A	DE, A1, 2458199 (TRICO-FOLBERTH LTD) 12 June 1975, see page 15, line 1 - line 14 --	1-3
A	SE, A, 382950 (E DREIMAN) 23 February 1976, see the whole document --	1,3,4
A	DE, A1, 3346384 (SWF AUTO-ELECTRIC GMBH) 4 July 1985, see the whole document --	1
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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
9th September 1992	1992 -09- 14
International Searching Authority	**Signature of Authorized Officer**
SWEDISH PATENT OFFICE	Hans Nordström

Form PCT/ISA/210 (second sheet) (January 1985)

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, with indication, where appropriate, of the relevant passages	Relevant to Claim No
A	US, A, 437641 (KOHLER ET AL.) 7 September 1982, see the whole document --	1

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO. PCT/SE 92/00410

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the Swedish Patent Office EDP file on 31/07/92
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